Correspondence.

Insect Strategy.

To the Editor of the Scientific American:

Apropos of article entitled "Strategy of the Ants," which appeared in issue of the Scientific American, July 21, 1900, I would say that when away from my business as mechanical engineer, natural history has been my hobby for years. An instance of ant sense that came under my notice several years ago, was as follows:

I had just killed a wasp and left the carcass on the ground, waiting for my friends the ants to remove it. Along came one fellow, walked all around the wasp's body, making notes evidently of size, quality of flesh, etc., and off he went and brought up a small army of his brothers. Of these some fell to and devoured the soft portions of the body which would not keep, while others began to dissect ready for storing the harder portions which would keep for winter consumption. The day was gusty, and my attention was attracted in particular to one little chap who was trying to get to his ant-hill with a wing he had severed from the body. He would struggle along two or three inches, when a sudden gust of wind would blow him and the wing back further than he had advanced. He put up with this till he found it hopeless, then carefully laying the wing down and piling the largest grains of sand he could lift on it so that the wind would not blow it away, returned to the body of the wasp and got three of the ants who had been feeding while he worked and brought them back to where the wing was, at the same time evidently explaining to them the difficulty of carrying such a bulky piece on a windy day.

They all got on the side of the wing where the heavy strengthening rib is and began to roll the wing up just as one would roll a flag around its staff. When this roll was finished, three cuts were made through it by three pairs of ant mandibles, and the four short, easily hauled rolls of wasp wing were successfully carried to the ant-hill by four industrious ants.

A curious instance of the ability of an insect to successfully measure distance was evidenced once while I was traveling through northern Argentina.

I first made the acquaintance of my friend on the back veranda of a little village tavern. I was lying in a hammock. About 2 feet from me was a 3 by 3-inch hand-rail of wood, supported by wooden balusters. As I lay there I noticed a fly alight on the top of the wood. While I watched him the fly apparently turned into a spider. I could not believe my eyes, but on closer inspection I saw that a spider had jumped from somewhere and alighted on top of my fly. I thought this worth watching and found that this was his method of procedure. A fly would alight on top of the railing, the spider would take in the distance at a glance and would disappear down the side of the rail, walk along toward the fly, but out of sight, until he reached the place on the side of the rail at right angles to the position occupied by the fly when he last saw it. Then he would walk nearly to the top of the rail and fasten his web, then walk down, paying out his web as he went, till he was as far from the place where he had fastened his web as was the fly, then one vigorous leap, the web swinging him round in the arc of a circle, and he would alight on top of the fly.

I have never seen one miss this seemingly difficult leap, except when the fly left his position before the spider had finished his preliminaries.

E. A. Suverkrop.

Philadelphia, Pa., August 21.

The Newport Automobile Races.

It is thought that records for fast riding will be broken at Newport September 6, 1900. Public interest is becoming aroused in the coming races to be held at Aquidneck Park on Thursday, September 6.

Newport society has taken up the automobile in earnest, and the races will be well supported; in fact, will be among the events of the season. A large number of entries have already been made, including Mr. W. K. Vanderbilt, Jr., who is expected to ride in his famous German racing machine, and who has also entered his steam carriage built by The Locomobile Company of America.

Mr. Harold Vanderbilt has entered his three-wheeled tricycle and other tricycles; steam, gasoline and electric carriages will be driven by many others, including Mr. George I. Scott, Mr. Max Muller, Mr. Knight Neftel, of Boston. The New England Electric Vehicle Transportation Company will also probably enter one of their racing machines.

Handsome prizes have been offered, many of which are cups offered by W. K. Vanderbilt, Jr., Mrs. Herman Oelrichs, Mrs. O. H. P. Belmont, The Locomobile Company of America, and The New England Electric Vehicle Transportation Company. One of the most interesting occasions of the season is expected, and those interested in horseless carriages will have a splendid opportunity of comparing various styles of vehicles. The time records, it is expected, will be broken, and an exciting, as well as an interesting day, is assured.

Carriages will be divided into four classes, viz.: Gasoline, steam, electric, and three-wheel tricycle.

Races in each class will be run in heats, the winners in each heat qualifying for the final heat in that class and the winners of the final heats in each class will be eligible to compete in a race comprising all classes. The distance of each race will be five miles.

In case of the attempt of an operator to prevent a carriage from passing him after the overtaking carriage has obtained an overlap, the offending operator will be disqualified.

Laundry Machinery and Practice.

In the modern laundry, machinery has come to take the place of the old hand labor to such a degree that it may be said without undue exaggeration that the civilized world, especially in American cities, washes itself entirely by machinery. Even when the return to hand-laundered goods is the fashion, and the work is done openly in the windows by experts, machinery figures as a prominent factor in the operation. In most cases the hand-irons are modern inventions, heated by electricity and not by the old-fashioned slow method on the stove. It is estimated that an ironer who has to keep changing his irons every minute or so loses about half his time, and that one provided with an electric iron can perform nearly double the amount of work with no greater effort.

There is no justification for any modern laundry to use chemicals for washing clothes, for washing machines are so perfect to-day that dirt can easily be washed out of clothes, and there is no good reason for resorting to chemicals to accomplish this work. There are scores of washing machines on the market, big and little, but the large laundries usually employ machinery that makes quite an expensive plant when finally put up. The washing is done by means of two cylinders, one within the other, and made either of metal or wood. The clothes are put into the inner cylinder, which is perforated on all sides with little holes, and the door then closed. Powdered or liquid soap is also put in the cylinder, and hot water or steam is admitted through valve connections at the top. The outer cylinder is little more than a cylinder jacket for the inner one, and the space between them is very slight. The inner cylinder is made to turn continuously, first in one direction, and then in the other, and the water can be changed without opening the doors. Thus, the clothes get a thorough shaking up and twisting, and then a first, second and third rinsing in hot or cold water. The dirty water oozes out through the perforations and runs off, while fresh water is introduced through the valve connections on top. Clean water can thus be constantly dashed over the clothes, while the old is carrying off the dirt below. The last step in the washing process is to introduce cold blued water, and then the clothes are removed.

The next machine in the process through which the clothes pass is the big centrifugal wringer, which is a nicely adjusted machine that can wring clothes almost as dry as if exposed to the sun for a few hours. It is so totally different from the average housewife's conception of a clothes wringer that it is worth looking at. It has anything but the conventional type appearance, and looks more like a big wash-tub or bowl-like barrel than a wringer. It is really composed of a big iron and copper bowl, the latter fitted in the former and perforated with many holes. This extractor, as the inner copper bowl is called, revolves at the rate of a thousand revolutions a minute. The clothes are put in this revolving extractor, and the water and moisture are thrown out through the perforations by centrifugal force. The water thus ejected falls into the outer bowl of iron, and runs off below. This method of wringing the clothes has been found to be more economical, quicker, and less destructive to the materials than the old-fashioned way of squeezing them through two rollers.

The third process in the modern laundry is the starching, and this, too, is performed by machinery. There are several kinds of starching machines on the market, and some large laundries have several patterns to suit the different classes of work on hand. Some clothes require very little starching, and the machine for these is very simple and does little more than turn the clothes over a few times in the starch. Clothes that require the starch to be worked thoroughly in the material, such as shirts and collars, are put in starchers, which actually knead the starch in the fabric as successfully as the housewife's hand could do it. The starchers are more simple in arrangement than most of the other machinery, and some laundries are not provided with them, and the work is all done by hand. Laundries that make a specialty of "dry washing" can easily dispense with the starching machines, for clothes thus cleaned are merely washed and dried and returned to the owners without being starched or ironed. Many housewives in cities prefer this method, sending most of their washing to the laundries, and having the starching and ironing done at home.

The drying room of the laundry is fitted up with long rows of racks or frames, which can be kept moving on rollers by means of a belt, and any set of these dryers can be operated separately or together. The temperature of the drying room is regulated to suit the occasion, and it can be kept at any degree desired. Usually the temperature is so high in the drying room that it is uncomfortable, and sometimes dangerous for employes to enter it, and the need of being able to operate the drying frames from the outside so they can be filled or emptied at will is quite imperative.

There are dampening machines to which the clothes go next, and these are sometimes in the form of patent sprinklers or simply surfaces which are brought in contact with the clothes for a fraction of a minute. When the clothes pass from the dampeners they are in perfect condition for the ironers. The machines for ironing clothes are probably more numerous and complicated than for any other part of laundry work. Inventors have devised some sort of machine for ironing simply and quickly almost every article of human wear. Machines for ironing shirts, collars, sleeves, wrist-bands, yokes, cuffs, and similar parts of our washable dress apparel have long been in use. Every time a new-fashioned article of underwear is devised by a dressmaker, the inventors of laundry machinery find a new demand for their labor, and if the article has come to stay, some new wrinkle for ironing it quickly and simply will be invented sooner or later.

In a great many laundries fine hand work is the only rule for anything like collars, shirts, and cuffs, but the vast majority of us have these articles ironed by machinery. Collars and cuffs are first ironed flat by machinery, usually by running them through two heavy rollers, and then they are separately ironed on special machines. The turn-over collars are put through a special machine, which folds them over and straightens the edges to the required natural curve. Shirt-ironing machines are made to fit bosoms so perfectly that when the goods are finished one would hardly be able to distinguish the work from that performed by hand. Yokes, sleeves, and wristbands likewise have their separate machines which fit into them snugly and give in a few seconds the shape and effect that the hand-worker obtains only after a long time of skilful work.

Machinery for ironing has proved of the greatest benefit in doing up flat goods, such as hankerchiefs, pillow cases, sheets, napkins, and tablecloths. An immense amount of work can be accomplished in a short space of time by one of these machines under the operation of a girl or woman. The modern mangle has been developed to such a point of perfection that it is capable of ironing all the flat goods of a large laundry as fast as they can be turned out of the washers and drying rooms.

The mangles are of all sizes, from those constructed for hotel use to the big fifteen-ton machines with rolls from seven to nine feet in length. The latter size of machine is only suitable for the largest laundry, but where the amount of work justifies the erection of one it well pays for the investment. It will turn out all the goods that several girls can feed to it, not only smoothly ironed, but folded and creased properly for immediate delivery. Laundry machinery is a distinct branch of trade, and manufacturers of the machines confine their attention to these alone. New machines and inventions are, of course, being introduced every year by these big concerns, but already the list of laundry machines is so great that hundreds of pages of a catalogue are required to describe them.
—G. E. W.

A Hot-Box Cooler.

Two Western inventors have devised a simple hot box cooler. It consists of a pipe which is thrust into the journal-box, being held in position by a hook. The pipe is attached to a rubber tube which runs up to a pail of water which is secured to a grab iron by a short piece of iron pipe. The rubber tube is supplied with several encircling suspension brackets which contain a small nail that is driven into the side of the freight car at desired points of suspension. The water siphons down from the pail, cooling the journal and keeping the waste wet. The arrangement can be quickly applied to any freight car.

"Gall of the Earth."

The faculty of the Chattanooga Medical College is now making experiments with the weed known as "Gall of the Earth," with which a mountaineer recently cured himself of a mad dog bite, and by which he cured others suffering from snake bites. It is sometimes known as the "rattlesnake's master." The weed is now being transplanted for cultivation and experiment. It is now in bloom and bears a small white flower. The Horticultural Department of Clemson College, Charleston, S. C., is also experimenting with it.

A New Park for Washington.

A new park is to be built at Washington, D. C., south of Pennsylvania Avenue and B Street, S. W., and also a parkway between Potomac Park, or reclaimed flats, and the Zoological Park. Samuel Parsons, Jr., the well-known landscape architect, will draw the plans.

Engineering Notes.

Extra firemen were assigned to help the regular firemen on heavy freight locomotives of the Central Railroad of New Jersey during the months of July and August.

The order of 208 guns and two destroyers for the Turkish Navy has been placed with Messrs Krupp of Essen, notwithstanding that the tender of Messrs Armstrong, Whitworth and Company, of Great Britain, was over $400,000 less than that of the German firm.

The English Admiralty are experiencing the effects of the high price of coal in England. They have just signed contracts with Cardiff firms for the supply of 150,000 tons of Welsh steam coal at prices varying from $6.50 to $7 per ton. This is the highest price the Naval Department has ever paid for this coal, except in the time of strikes. The whole consignment has to be delivered at the naval depots during the next four months. An American engineering firm has also recently signed a contract for 30,000 tons of coal with a north of England colliery.

In the early part of this year several private firms of ship-builders in Great Britain, who had torpedo-boat destroyers upon their stocks under construction, offered the same to the British Admiralty. The Naval Department has closed with five of these offers, which involves a total cost of $1,753,000. One of these destroyers, which was constructed by the well-known Elswick firm, is fitted with the new turbine motor similar in design to that invented by Messrs Parsons, the constructors of the "Viper." For this vessel alone $822,550 were paid. With this extra expenditure, and together with one or two other items, the British naval estimates for 1900 represent the total of $143,959,500.

Now that the Boer war is confined to the northern corner of the Transvaal, the Natal government has commenced the reorganization of its railway system, which was destroyed by the Boers during their incursion into British Territory. The English engineering firms are being flooded with orders for locomotives, wagons, carriages, and steel rails, to replace those destroyed or damaged during the war, and also to provide additional rolling stock, which will be required to meet the increasing trade of the colony. So far the contracts have been placed with English firms entirely. Contracts have been placed for the reconstruction of the bridges, and the orders are being pushed forward with all possible speed.

The commercial prosperity of Great Britain is still strongly in the ascendant. According to the Board of Trade returns, which were published a few days ago, the imports from foreign countries and British possessions during the month of July amounted to $201,320,835, representing an increase of $1,643,975 over the corresponding month of last year. The total value of imports for the seven months of this year ending July was $147,495,165, or an increase of $96 299,630 upon the same period for last year. The exports of British produce and manufactures for the same month amounted to $122,752,785, or an increase of $6,772,995 upon the value of the exports during the month of July, 1899, while the total value of the exports for the first seven months of this year is $844,636,605, or an increase of $96,047,345.

A curious accident occurred on the Derbyshire portion of the Great Central Railway of England during the spell of tempestuous weather at the beginning of August. A terrific cloudburst occurred over the Derbyshire hills during the gale, and the hillsides were transformed into raging torrents of water, which uprooted trees and swept away all obstacles that opposed their progress. Thousands of tons of rocks and great masses of earth were carried along by the water and swept upon the railway, completely burying it for a distance of over two miles. Fortunately, no trains were passing over the destroyed section at the time of the disaster, otherwise the loss of life would have been terrible. Over 5,000 men were immediately requisitioned to clear the track, which occupied more than two days' incessant work.

Now that the price of coal has increased to such an enormous extent in England, as a result of the vast quantities which are exported to foreign countries, attempts are being made to obtain a cheaper fuel, especially for the benefit of the poorer classes. Experiments are being made with peat. At Tregaron, in Cardiganshire, there is a vast bog, 4,000 acres in extent, in which the peat extends in veins varying from 20 feet to 50 feet in thickness. It is stated to be very rich in carbon, and attempts are to be made to extract this carbon and to compress it into briquettes, after the process advised by some German scientists. These briquettes are stated to be equal to the best steam-coal, and it is estimated that the fuel could be sold in large quantities on the ground, at the small price of $1.25 per ton. The most difficult question, however, is that of transit to the principal centers. Where canals can be used for transit the cost of conveyance is very small, but the high railway rates preclude it from being carried to the remote towns and sold at a reasonable figure.

Electrical Notes.

The Great Western Railway of England is lighting its corridor trains by electricity obtained from dynamos driven from the car axle. Storage batteries are carried for use when the running speed is slow and for stops.

By arrangements with the two governments of France and Germany, a telephone service has been inaugurated between Paris, Frankfort, and Berlin. The charge for the use of the wire between Frankfort and Paris is 80 cents for three minutes, and between Paris and Berlin $1.25 for the same time.

A new submarine cable is about to be laid between England and Germany. This is the fifth cable, and a comprehensive idea of the increase in the cable traffic between the two countries may be gathered from the fact that, whereas in 1896, when the fourth cable was laid, the annual number of cablegrams was 1,867,868 per annum, no less than 2,465,613 cablegrams are now annually transmitted.

The Trinity House Brethren, who control the lighthouses of Great Britain, have granted permission for the installation of Marconi's wireless telegraphic system between the lighthouse at the Mumbles and the mainland at Ilfracombe on the west coast of Devonshire. The pole for carrying the high wire at Ilfracombe is 116 feet 3 inches in height; measures 1 foot 5 inches in diameter at the base, tapering to 3½ inches at the top; and weighs nearly two tons. The pole, which is the largest in the country, has been placed at a depth of 6 feet in the solid rock.

The London County Council have at last received Parliamentary sanction to convert the horse tramways which they have recently purchased throughout the metropolis into electric tramways. The underground conduit system will be employed, as public opinion has successfully protested against the overhead trolley system on the plea of marring the beauty and interfering with the traffic of the streets. The length of tramways to be converted to electric traction comprises 115 miles, so that it will be some time before the whole system is working electrically.

The corporation of the town of Frankfort (Germany) is enlarging the municipal central electric station, and has just placed an order for a 400 horse power single phase turbo-alternator. The present capacity of the central station comprises four 500 kilowatt units and two 1,000 kilowatt units, and two more of the latter are now in course of erection. The total capacity of the motors connected with the mains is over 5,000 horse-power. The turbo-alternator which is now being constructed will be the largest ever made. It will register 1,360 revolutions per minute and will generate a current at a tension of 3,000 volts, and when working on an inducted load having a power factor of 80 per cent, will yield, if necessary, the full output of 4,000 horse power.

A few days ago an alarming accident occured in the Strand, London. By some means, the underground electric circuits were fired, with the result that the lid over a manhole in the footpath was blown high into the air. Large sheets of flame then shot into the air for a height of about ten or twelve feet, attended at frequent intervals with sharp explosions. The alarm was immediately given to the fire brigade, who were quickly on the spot, but it was instantly recognized that their efforts were of no avail in the quelling of the conflagration. They consequently had to stand by and simply watch the results of the erratic behavior of the electric current. In a few minutes, however, an electrician was on the scene and he quickly subjugated the outbreak by severing the wires. Such accidents as this are of frequent occurrence throughout the metropolis, but at this precise point the number of wires is very great, which rendered the incident far more serious than is generally the case.

Mr. Gregor Blanck, the Hungarian who has invented a loud speaking telephone, is at present in London, negotiating with the British Post Office and the National Telephone Company, for the introduction of his instrument upon their system. The Post Office has informed the inventor that if he can construct an instrument with which it will be possible to telephone a distance of about a thousand miles, with ease, and without having to shout into the instrument, so that the words may be distinctly distinguished at the other end, they might be disposed to avail themselves of the invention. The inventor has been busily engaged upon a machine for this purpose, and by the aid of a very powerful inductive coil has succeeded in telephoning over a distance of a thousand miles, and will shortly experiment with his improved instrument before the authorities of the Postal Department. The crux of the invention is that by means of the coil, articulation of the speaker is intensified as the words pass along the wire. Besides connecting the instrument with the telephone, the inventor will attach it to electrophone, and by this means one will be able to sit in a room and listen to what is happening at the theater, without having to insert the tubes into the ear, as is now necessary. The sound would proceed from the electrophone in much the same manner as they are recited by the phonograph.

Automobile News.

Cyclists should take warning and not ride behind motor-carriages. In England a wheelman was riding behind a horseless carriage; the latter was brought suddenly to a standstill, and the cyclist sustained a serious injury to the brain.

The recent hot weather with which New York was visited brought into prominence the fact that the general introduction of the trolley has mitigated the scenes of animal distress which were so common when the cars were hauled by horses. According to The Electrical World, during one hot season the Third Avenue line lost 600 horses in a few weeks, besides having 300 in the hospital. The horse of the cab and dray is also being gradually emancipated by the slow but sure introduction of automobile vehicles.

The Austrian Army is giving the automobile a series of severe tests, in its army maneuvers this year, to determine how far it is applicable to the battlefield. The military authorities have ordered twelve Bollée-Ditrich automobiles from the factory in Baden, which will be employed in connection with the ambulance corps. The staff officers are also going to be mounted on automobiles, motocycles being requisitioned in their cases. The experiments will be very exacting, since the maneuvers will take place in the Carpathian Mountains, a territory hardly adapted to the successful employment of automobiles to any great extent.

A clergyman in England undertook to drive his De Dion voiturette after a few hours' coaching, says The Motor Car Journal. He was spinning along at a rapid pace when a cyclist suddenly cut across the road. It was the first emergency in which he had been involved, and consequently he had not that instantaneousness of action which is essential to the motor-driver. The car crashed into the cyclist broadside, and then the whole mix-up went into the ditch. The passengers were not seriously hurt; but the motor car had its axles broken, while the bicycle was completely wrecked. Mr. T. Ireland, of Belfast, had another nasty experience near Bangor. A shying horse caused him to swerve his car so indiscreetly that it turned right over, shedding the occupants precipitately. Once again good fortune prevented any serious bodily mishap.

A new steam-automobile has been brought out by the Mann Company, of Leeds. It is designed to transport loads of four tons; it is a four-wheeled vehicle, carrying in the rear a truck with a platform 11 feet long by 6 feet wide; its extreme dimensions are 6 by 17 feet. The platform is independent of the tractor, and is carried upon its own wheels, which are of the same diameter as those of the machine and spaced at a considerable distance; the wheels of the rear truck are united to the motor by gearing, so as to render them equally effective; the advantage of this combination is that all the weight is utilized for adherence. The wheels are of iron and steel; those in front have 35 inches diameter, those in the rear, 46 inches, the tires being 5½ and 12 inches wide respectively. The tractor resembles a road-locomotive. The furnace, of locomotive type, has the fire-gate placed on the side next the conductor; it has four square yards of heating surface. The water-tank has a capacity of 230 gallons, and the coke-box contains 200 pounds. The engine, of the compound type, has a high-pressure cylinder of 4 inches diameter; that of the low-pressure is 6½ inches, with a stroke of 8 inches. The valves are operated by eccentrics provided with reversing arrangement of special construction. For starting on high grades, a valve permits the introduction of high-pressure steam into the low-pressure cylinder. The feed-pump is furnished with a by-pass by which the supply is regulated; an injector is also provided. The transmission from the main shaft to the axles is made by steel gearing and differential; two changes of speed are provided, one being two and one-half times the other. Strong brakes are provided for all the wheels. The weight of the vehicle complete, without water or combustible, is 6,500 pounds, the truck weighing 2,400 pounds. The vehicle was tested at the time of the Bradford Exposition. It was loaded with four tons of wool in bales and four passengers, besides the conductor. It left Bradford at 10 h. 25 m. A. M., and came back to the starting point at 8 h. 27 m. P. M., having made a certain number of stops to take water or fuel, etc. Taking account of the different stops, which lasted 3 h. 47 m., an average of 4·6 miles per hour is obtained. The consumption of coke or coal needed to keep up the pressure during the stops was 330 pounds; under the above conditions, about 10·4 pounds of coke were burned per mile. The total quantity of water consumed was about 600 gallons. The starting and stopping was effected rapidly and without difficulty on level or on grades; the noise is not excessive for a vehicle of this kind, and there is scarcely any smoke or steam. The committee considered this type of vehicle as one of the most satisfactory solutions of the problem of freight transportation on roads. The cost of transporting a ton of merchandise per mile will not likely exceed $0.07, compared with $0.15 for horse transportation.